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Falls among Community-Dwelling Older Adults: Determining the
Relationship between Social Networks
and the Risk for falls

By
Smita Sikhrakar

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Science
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Aging Studies

Minnesota State University, Mankato

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Falls among community-dwelling older adults: Determining the relationship between social networks and the risk for falls.

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ABSTRACT

Falls among community-dwelling older adults: Determining the relationship between social networks and the risk for falls

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Falls among community-dwelling older adults is a big public health problem, which have an effect on older adults' health, independence, and quality of life. The purpose of this study was to determine the relationship between social networks and the risk for falls among community-dwelling older adults. This was a descriptive correlational study, which utilized a cross-sectional survey for the data collection. The dependent and independent variable of this study were the risk for falls among the community-dwelling older adults, and the strength and type of social networks respectively. In this study, 218 community-dwelling older adults were recruited, who were living in the south-central Minnesota in the United States. A paper survey was distributed, which included the Demographic Tool, Fall Risk Questionnaire, and Lubben Social Network Scale. However, the total number of participants who completed the survey was 184 older adults. The results of this study showed that there is a weak negative relationship between the strength of social networks and the risk for falls, but was not statistically significant. It is recommended to conduct future research with the inclusion of gender as an independent variable to understand their impact on the relationship between social networks and the risk for falls. In the future, a tool that measures the impact of structural and functional dimensions of social networks on the risk for falls is necessary to understand the relationship between social networks and the risk for falls.

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CHAPTER I

INTRODUCTION

In the United States, falls among older adults are a major public health issue. The World Health Organization (WHO) defines a fall as “An event which results in a person coming to rest inadvertently on the ground or floor or other lower level” (2004, p. 5), but “not as a result of a major intrinsic event (such as stroke) or overwhelming hazard” (Masud & Morris, 2001, p. 3). Falls can happen to individuals of any age, however the occurrence is very common among older adults, who are at higher risk for falls when compared with members of other age groups. Rekeneire et al. (2003) reported, that in the United States, almost one out of three community-dwelling older adults who are 65 years or older fall at least once a year. In general, falls are not only a threat to the elderly population, but falls also have a significant impact on other family members including children, spouses, and relatives, on healthcare services, and on society as a whole.

Background

According to the Centers for Disease Control and Prevention (CDC), falls are the leading cause of both fatal and nonfatal injuries, and of injury-related death among older adults (2014). Tinetti, Gordon, Sogolow, Lapin, and Bradley (2006) reported that 10% of falls led to serious health injuries such as hip fracture, head trauma, and soft-tissue injury among older adults. Moreover, fall-related injuries often lead to hospitalization, institutionalization, and even death.

The CDC (2014) reported that in 2012, about 2.4 million people 65 and older were treated in emergency departments for nonfatal injuries from falls, and more than 722,000 of these patients were hospitalized. Nearly one-fourth of older adults died within 6 months of hip fractures as a result of falls, and 50% of survivals of fall-related injuries are discharged to a nursing home (Colon-Emeric, 2002). After a fall, older adults may not only suffer serious injuries related to the fall itself, but as a result of those injuries, there is often a rapid decline in functional ability, or an increase in disability.

Many falls among older adults may not cause any serious physical injury, but may cause an increase in psychological fears of falling (Rogerson & Emes, 2008). Consequently, older adults may limit activities and social engagements as a result of their fear of falling. Huang, Gau, Lin, & Kernohan used the term “vicious cycle” to explain the phenomena of fear of falling (2003, p. 402). They mentioned that experiencing a fall may cause a fear of falling, and a fear of falling may affect the quality of life of older adults, such as restrictions on physical activity, declines in the performance of activities of daily living, and reductions in mobility. The restriction and limitation of activity can lead to muscle weakness; thus psychological fear of falling may escalate actual risks of future falls in older adults. Furthermore, fear of falling can contribute to depression, social isolation, and feelings of helplessness owing to individuals’ loss of independence and mobility (Means, O’Sullivan, & Rodell, 2003).

Statement of the problem

Among older adults living in the community, falls and falls-related injuries are major threats to older adults’ health, independence, and quality of life. It is very important to develop strategies and interventions to prevent falls and fall-related injuries because the proportion of

adults who are 65 years or older is growing dramatically, not only in the United States but also globally. By 2030, it is expected that the older population will represent almost 20% of the total population in the U.S. (Ortman, Velkoff, & Hogan, 2014). In addition to advancements in science, technology, and medicine that have resulted in increased longevity; there is another factor that has heightened the need for fall prevention strategies for older adults. There is an increasing preference among the older adults for aging in place versus living in a nursing home or an assisted living facility (Marek et al., 2005).

Erber (2013) defines aging in place as growing old in the home and in the locality where older adults have spent most of their lives, without the need to move to alternative living arrangement such as a nursing home, retirement community, or assisted living facility. Since many older adults now prefer to age in place, family members such as spouses and children may be concerned about their loved one falling and foresee the need for increased supervision to prevent falls (Darowski, 2008). Family members are more likely be the primary source of caregiving after a fall, providing assistance with activities like cooking, washing, dressing, and shopping. According to Darowski (2008), falls and fall-related injuries may increase burdens on family members, and may also produce increased stress and anxiety. In this way, falls may not only have impact on older adults themselves, but also may have significant effects on their families and caregivers.

Falls can also generate huge economic and personal costs. The National Council on Aging (2014) reported that the direct medical cost of fatal and nonfatal fall injuries in 2012 was about \$36 billion in the United States. This figure is expected to increase to \$59.6 billion by 2020 as the U.S. population continues to age and live longer. Falls among older adults can also be a significant cause of financial stress among children and spouses, especially if they cannot

personally provide necessary care, and they need to hire professional caregivers (Darowski, 2008). This is an important area of concern for the aging studies and the health education disciplines, as fall prevention among older adults dwelling in the community is a significant factor in promoting healthy aging and aging in place.

Significance of the Problem

Although the risk of falls increases with advancing age, falls are a highly preventable health problem, and are not merely an inevitable part of aging. Falls leading to disability and loss of independence during older adulthood can be managed, reduced, and prevented. According to Rekeneire et al. (2003), older adults who are 80 years or older have 50% more likelihood of fall than the younger cohort aged 65 to 79 years. Much research has identified potential fall risk factors such as visual impairment (Kelsey et al., 2010), musculoskeletal disorders, depression, medications, age, and gender (Rekeneire et al., 2003; Jung, Shin, Chung, & Lee, 2007).

There is a great amount of research which has identified a relationship between social networks and health. Thanakwang and Soonthorndhada (2011) reported that social networks can influence health promoting behaviors and impact healthy aging. Likewise, Chan, Malhotra, Malhotra, and Ostbye (2010) found that depression is common among older adults with a weaker social network outside their household. Moreover, Vance, Ross, Ball, Wadley, and Rizzo (2007) found that the size of an individual's social network was an important predictor regarding the number of physical activities in which older adults participated.

However, few studies have been conducted which examine social factors such as marital status, social support, social integration, and support system as potential risk factors for falls among older adults (Faulkner et al., 2003; Huang et al., 2003; Guzman et al., 2013). Huang

(2003) and Guzman (2013), in their research, were unable to find a significant relationship between social variables and the risk for falls. The limited research on the impact of social networks on falls shows a need to fill this gap, and to more closely examine the relationship between the size and quality of an individual's social network and their risk for falls.

Purpose of the Study and Research Questions

The purpose of this study was to determine the relationship between social networks and the risk for falls among community-dwelling older adults. The research questions for this study were as follows:

1. For community-dwelling older adults, what is the relationship between the risk for falls and strength of their social networks?
2. For community-dwelling older adults, is the relationship different between the risk for falls and social networks of family, neighbor, and friendship?

Hypotheses

The hypotheses for this study were as follows:

1. There will be a negative relationship between the risk for falls and strength of social networks among community-dwelling older adults; all else being equal.
2. The relationship between the risk for falls and social networks of family, neighbor, and friendship will be different among community-dwelling older adults; all else being equal.

3. There will be a difference between community-dwelling older adults who are at risk for falls and not at risk for falls based on the strength of their social networks, all else being equal.

Note: Strength of social networks includes the size and quality of the social networks, which is measured by the Lubben Social Network Scale.

Theoretical Framework

This study used Berkman, Glass, Brissette, and Seeman's (2000) theoretical model of how social networks impact health as its conceptual framework. This model presents two sets of factors which explain the effect of social networks on health. This process model showed the influences of social network on health via two different determining sets of factors; namely upstream factors and downstream factors. The upstream factors included social and cultural factors, which have a significant effect on the structure and characteristics of the social network such as size, proximity, and frequency.

On the other hand, the downstream factors consist of psychosocial mechanisms, which are usually the outcomes of the social network. The downstream factors also explained different pathways that were successful in showing the impact of the social network on health status. The pathways showed that the various outcomes of social network such as social support, social engagement, social influence, and so forth are capable of positively impacting one's health. As the current study sought to examine the relationship between social networks and risk for falls among community-dwelling older adults, the upstream factor: social networks of the Berkman's theoretical model had been utilized.

Assumptions

This research study was based on several assumptions. Firstly, the researcher assumed that the participants answered the survey items honestly. Secondly, the researcher assumed that all participants understood the questions used in the survey tool.

Definition of terms

Community-dwelling older adults: Adults who are 65 years or above; living in the community in their own homes, non-institution settings, and assisted living facilities; excluding those who live in nursing homes and skilled nursing facilities.

Social networks: “The web of social relationships that surround an individual and the characteristics of those ties” (Berkman et al., 2000, p. 847). Those social relationships provide opportunities for social support, social influence, social engagement, contact with others, and access to resources.

CHAPTER II

REVIEW OF THE LITERATURE

In the United States, falls among community-dwelling older adults are a major threat to their health as falls may lead to injuries (Shumway-Cook, Ciol, Hoffman, Dudgeon, Yorkston, & Chan, 2009) and loss of independence (Darowski, 2008). In addition, falls and fall-related injuries may lead to hospitalization, institutionalization (Cumming, Salkeld, Thomas, & Szonyi, 2000; CDC, 2014), and mortality (CDC, 2014). For several decades, falls among older adults have been a topic of concern among many researchers. Those researchers had keen interests in finding causes and consequences of a fall, and proposing evidence-based interventions to prevent falls.

According to Nnodim and Alexander (2005), falls and injuries-related to falls are not possible to eradicate completely from the list of public health problems. However, an accurate identification of risk factors associated with falls occurring in community-dwelling older adults can be an important part of developing any fall prevention strategy. The appropriate intervention may help in the prevention and the reduction of fall occurrences and fall-related injuries among community-dwelling older adults. Therefore, development of robust fall prevention programs may not only be helpful in maintaining independence among older adults, but may also reduce disability, and promote physical and psychosocial well-being.

Purpose of the Study

The purpose of this study was to determine the relationship between social networks and the risk for falls among community-dwelling older adults.

Review of the Literature

The literature review helped to identify and select multiple research articles, which provided knowledge and enhanced understanding regarding falls among community-dwelling older adults. The findings of these research articles that were reviewed during the process were categorized into following five topics: 1) Risk factors for falls, 2) Consequences of falls, 3) The overview of theoretical model: Impact of social networks on health of older adults, 4) Benefits of social network for older adults, and 5) Research on the relationship between social variables and falls.

Risk Factors for falls

Risk factor is defined as “A characteristic of clients or their environments that can affect the likelihood of them suffering an adverse response” (Huang et al., 2003, p. 400). There were various studies that identified innumerable risk factors for falls. Newton (2002) stated that the cause of a fall among older adult is not only limited to a single factor rather it is an outcome of interaction between various risk factors and the presence of multiple risk factors. Newton (2002) has categorized fall risk factors into three subgroups: 1) Intrinsic risk factors, 2) Extrinsic risk factors, and 3) Environmental risk factors, which are described below:

Intrinsic risk factors. The intrinsic risk factors for falls include those risk factors that are related to “normal age changes, medical and physical problems, medications, cognitive impairment, and degree of physical inactivity” (Resnick & Junlapeeya, 2004, p. 82). Gender and

race are also included in this category which are also known as non-modifiable risk factors for falls. Rekeneire et al. (2003) found that falls were more common among older adults who were women, Caucasian, taking a higher number of medication, and had several chronic diseases. They also reported that the fallers (n=652) scored lower on different physical measures such as lower extremity performance, leg muscle isokinetic strength, balance, two-minute walking, and 400 meters walking compared to non-fallers (n=2, 398).

The researchers also found that urinary incontinence symptoms (UI) and use of benzodiazepines were associated with increased risk factors for falls among women. In contrast, the men with UI symptoms and poor functional condition were at higher risk for fall. Likewise, Jung et al. (2007) revealed that the fallers (n=109) were more likely to have deficits in activities of daily living (ADLs) and instrumental activities of daily living (IADLs). The medications that have been identified to have association with falls are barbiturates, sedative hypnotics, and antihypertensive drugs. Resnick and Junlapeeya (2004) reported that 18% of falls in their study was associated with alcohol consumption, and use of barbiturates or sedative hypnotics and Callisaya, Sharman, Close, Lord, and Srikanth (2014) mentioned that the higher daily dose of antihypertensive drugs can significantly increase the risk for falls.

Furthermore, older adults with arthritis, hearing impairment, history of cerebrovascular incident, and who regularly take sleeping pills were at higher risk for falls (Huang et al., 2003). Huang et al. (2003) reported that older adults (N=103) with arthritis are almost nine times at higher risk for falls than someone without arthritis. Similarly, a hearing impairment increases risk for falls by seven times, a history of cerebrovascular accident by twenty three times, and use of sleeping pills increases by twenty two times among older adults. On the other hand, Jung et al.

(2007) did not determine any statistical significance between the falls and hearing impairment because nearly 78% of 143 fallers had no symptomatic hearing problem.

Moreover, Jung et al. (2007) found statistical significance between falls and risk factors such as equilibrium impairment, gait disturbances, mobility in chair, and number of chronic disease. They reported that almost 48.6% of women (n=109) with a history of fall had problems with mobility in chair, 17% had gait imbalance, 48.6% had equilibrium disturbances, 82.6% had a diagnosis of two or more chronic diseases, 8.3% had dementia, 9.2% had strokes, and scored lower on Korean Fall Efficacy Scale. Further, Guzman et al. (2013) stated that depression is one of the strongest predictor of the risk for falls. Guzman and colleagues found a positive correlation between depression and risk for falls. They explained that 0.24 increase in the standardized beta coefficients of the depression score increases the risk for falls score by 1 point. Therefore, the sampled older adults with depression are at higher risk for falls than their counterparts.

Extrinsic risk factors. The extrinsic risk factors related to falls are composed of outdated eyeglass prescription, taking four or more prescribed medications, ill-fitted footwear, and use of assistive devices (Newton, 2002). Jung et al. (2007) found no statistically significant relationship between falls and the number of medications. In their study, 27.5% of fallers (n=109) reported taking three or more medications, while 29.1% of non-fallers (n=117) were also taking 3 or more medications. Evidently, more non-fallers than the fallers were taking 3 or more medications. Huang et al. (2003) found a statistically significant relationship between the use of assistive devices such as walkers or canes and the risk for falls. Their findings suggested that the use of assistive devices by older adults is a threat as it increases risk for falls. It was

reported that almost 53.8% of fallers (n=52) used assistive device compare to 19.5% of the non-fallers (n=51).

In contrast, Guzman et al. (2013) attributed the high fall rate of 53.6% (N=125) in their study to the fact that nearly 94.4% of older adults did not use any kind of assistive devices. It is quite unclear whether the use of assistive device poses a risk or prevents falls among older adults. Suzuki, Ohyama, Yamada, and Kanamori (2002) proclaimed that use of assistive devices is an effective fall prevention strategy. However, Newton (2002) explained that the use of assistive devices could be a risk for older adults with cognitive decline. They may have difficulty using assistive devices as they are more worried about using it appropriately than scanning the environment for safety and hazards. Therefore, this division of their attention while using assistive devices may increase risk for falls among older adults with compromised cognitive functioning.

Environmental risk factors. The environmental risk factors that can be threats to older adults and may lead to falls are environmental hazards such as loose carpet, bathtub without handrails, poor lighting, unsafe stairs, and wet or slippery or icy surfaces. Guzman et al. (2013) found a negative correlation between environmental safety and the risk for fall. They concluded that environmental safety as one of the strongest predictors of the risk for falls as they found that 0.28 unit increase in standardized beta coefficients of the environmental safety score decreases the risk for falls score by 1. In their study, they identified poor lighting and clutter as potential risk factors for falls among Filipino older adults. Thus, the safer the environment is for older adults, the less chances of the occurrence of the falls.

Consequences of falls

Unintentional falls are not only prevalent among older adults, but all populations, however, predisposed extrinsic, intrinsic, and environmental risk factors make older adults more susceptible. The consequences of falls have a huge impact on older adults compared to younger adults. Falls among older adults may cause serious injuries such as fractures, joint dislocation, and head trauma which could be fatal or non-fatal. Conversely, falls which have no lasting impact on physical health of older adults can have a significant impact on their psychosocial health as an older adult may develop fear of falls (Rogerson & Emes, 2008). The consequences of falls can be categorized into three groups: 1) Fall-related injury, 2) Hospitalization, institutionalization, and mortality, and 3) Psychological trauma.

Fall-related injury. Darowski (2008) claimed that there is a higher risk of fractures such as spine, hip, wrist, pelvic, ankle, humerus, and foot as a result of falls among older adults with osteoporosis. They further stated that hip fracture is the most common type of injuries related to falls. In 2010, there were almost 258,000 hip fractures among older adults and its occurrence is twice more common among women than men (CDC, 2014). Conversely, Resnick and Junlapeeya (2004) mentioned that 57% of participants (N=312) living in the continuing care retirement community had experienced a total number of 594 falls over a five year period.

Among those falls, approximately 28% had no consequences, however there were fall-related injuries among the fallers. Those fall-related injuries included 9% of fracture, 10% of hematomas, 13% of skin tear, and 22% of lacerations that required sutures or musculoskeletal pain which lasted for a week following a fall. Similarly, 47% of 341 falls among fallers (n=143) who was independently living in the community were reported as injurious while 53% of falls were noninjurious (Nachreiner, Findorff, Wyman, & McCarthy, 2007). Among these injurious

falls, the most prevalent fall-related injuries included 30% of soft tissue injuries, 9% of minor abrasions, 5% of fractures, and 5% of lacerations that did not require any suturing.

Hospitalization, institutionalization, and mortality. Most of the time, falls may not result in injury, but occasionally may result in serious injuries such as fractures and lacerations which could require medical attention (Shumway-Cook et al., 2009). In the study among older adults living in the community (N=263), only 9% of 143 fallers visited an outpatient care and 7% were admitted to emergency departments (Nachreiner et al., 2007). Similarly, Jung et al. (2007) reported that 11.5% of 109 fallers were hospitalized and 19% experienced minor injuries. Newton (2002) stated that 50% of the older adults who had a fall will be discharged to long-term care facility due to their inability to return home and live independently after a fall. Lastly, the CDC (2014) also reported that in 2011 around 22, 900 older adults aged 65 and older died from injuries related to unintentional fall. In this way, falls and fall-related injuries can lead to hospitalization, institutionalization, and mortality.

Psychological trauma. According to Newton (2002), a fear of falling is a risk factor for falls because it may lead to activity restriction and decline one's confidence to perform ADLs and IADLs without fall. A fear of falling is also known as "post-fall syndrome" can be an outcome of previous falls (Jung et al., 2007, p.13). It is uncertain that whether fear of falls is a cause or a consequence of falls among community-dwelling older adults, however the fear of falling is the major source of inactivity which creates a vicious cycle. Darowski (2008) pinpointed that older adults decrease their activity due to a fear of falls. Hence, the restriction in activity over time will subsequently affect their muscle strength leading to weakness, immobility, and muscle dystrophy and in return makes them more susceptible to future falls.

According to Cumming et al. (2000); Suzuki et al. (2002); and Reyes-Ortiz et al. (2006), there is a statistically significant relationship between the history of falls and fear of falling especially among women. Nearly, 46.4% of 92 women who fell during the past year were very fearful compared to 14.2% of 43 men (N=135) (Suzuki et al., 2002). Likewise, Suzuki et al. (2002) found that there was a statistically significant relationship between a fear of falls and ability to perform ADLs especially walking, dressing, bathing, and toileting among women. They reported that older adults with a fear of falling had a significant decline in their mobility which greatly influenced their ability to perform ADLs. Therefore, they concluded that limiting activities due to previous falls or a fear of fall increases the likelihood for older adults to become homebound or bedridden.

Besides a decline in functional ability, researchers Means, O'Sullivan, and Rodell (2003) also found that older adults who had fallen or experienced near fall could develop fear or anxiety about future falls and their consequences. Their study supported the conclusion that there is a positive relationship between fear of falls and anxiety, but could not determine any relationship between fear of falls and depression. Moreover, Cumming et al. (2000) found that adults with a fear of falls and a lower score on falls-efficacy scale (FES) had poorer health especially they had difficulties with performing ADLs. They also found that a fear of falling increases risk for institutionalization due to the negative consequences of restricted activity on physical and mental health.

The overview of Theoretical Model: Impact of Social Networks on Health of Older Adults

Berkman, Glass, Brissette, and Seeman's (2000) theoretical model of how social network impact health identifies two sets of factors to explain the effect of social networks on health: 1) Upstream factors, and 2) Downstream factors.

Upstream factors. In the process model, the upstream factors explain the effect of different social and cultural factors on the structure and the characteristics of social networks. There are two upstream factors, 1) social structural conditions, and 2) social networks. The social structural conditions include conditions such as culture, socioeconomic factors, politics, and social change. According to the model, these conditions are influential in building and shaping the structure and the characteristics of an individual's social networks. The different features of social network structure include "size", "density", "range", "boundedness", and "homogeneity" (Berkman et al., 2000, p. 847). On the other hand, the characteristics of network ties depends on the "frequency of face-to-face contact", "frequency of nonvisual contact", "frequency of organizational participation", "reciprocity of ties", "multiplicity", "duration", and "intimacy" (Berkman et al., 2000, p. 847).

Downstream factors. These factors consist of psychosocial mechanisms, which are generally different outcomes of the social network. The downstream factors also suggest different pathways which show the impact of the social network on health status. According to the model, there are five different psychosocial mechanisms. They are: 1) social support, 2) social influence, 3) social engagement, 4) person-person contact, and 5) access to resource and material goods which have a significant impact on individual's health outcomes. The pathways followed by these psychosocial mechanisms include health behavioral pathways, psychological pathways, and physiologic pathways.

Furthermore, the model explains that the social network has an ability to provide different type of social support such as instrumental, informational, appraisal, and emotional support. The model demonstrates that the social support can promote self-efficacy, improve mood, and reduce risk of stressful events and depression through the psychological pathway. Similarly, the social network through social influence can offer an opportunity to share attitudes and beliefs among an individual and their social networks. There can be an interaction regarding healthy behaviors such as health care utilization, alcohol consumption, smoking, and dietary patterns. Social influence can also increase individual adherence regarding medical treatment and exercise habits. In the same way, the social network offers an opportunity for social participation and social engagement. As a result of increase participation in social activities, the individual is able to build a sense of meaning and belonging in life which will eventually promote health (Berkman et al., 2000).

Benefits of Social Networks for Older Adults

According to Thanakwang and Soonthorndhada (2011), social networks may have a significant influence on health promoting behaviors and health outcomes. These researchers demonstrated that both family and friendship networks have potential to influence health-promoting behaviors and healthy aging among community-dwelling older adults in Thailand. They found that the relationship between health-promoting behaviors and social networks were positive with a Pearson correlation coefficient value of 0.27 for family networks and 0.44 for friendship networks (N=469). The impact of social networks on health outcomes can be explained by using psychosocial mechanisms mentioned by Berkman and colleagues. They are: 1) social support, 2) social influence, 3) social engagement, and 4) access to material resources.

Social support. Social support is defined as “A person’s belief that the members of their networks are actually supportive in various ways” (Stephens, Alpass, Towers, & Stevenson, 2011, p. 888). Ikeda and Kawachi (2010) mentioned that the social network is a source of social support and is capable of affecting well-being of an individual. The most common person who are used by older adults for social support are spouses, followed by sons, daughters, friends or neighbors, and then other relatives from their social networks (Chao, 2012). According to Goldman, Korenman, & Weinstein (1995), a person without a social contact or without recent participation in activities is at higher risk for mortality than the ones with social support. They reported that widowed men are 1.8 times more likely to be disabled compared to married men.

In addition, the researchers stated that marriage can have a great influence on individual’s social networks. That is, a person who is married has a larger social network as they have larger number of family members which includes their children and spouse. These family members can provide both emotional and instrumental support. Ikeda and Kawachi (2010, p. 238) mentioned that the emotional support received from one’s social network is capable of creating “positive affective state” which helps to reduce stress in individuals. Therefore, social support is not only influential in reducing depression among older adults, but can also act as a motivation for older adults.

Depression. Social support is an essential component of healthy aging, which is successful in reducing depression, isolation, and loneliness (Schnittger, Wherton, Prendergast, & Lawlor, 2014). Zhang, and Li (2011). Golden et al. (2009) explained that marital status is a significant predictor of depression among older adults. It is reported that widowed older adults were more likely to exhibit higher levels of depressive symptoms than married older adults (Zhang & Li, 2011). The higher prevalence of depressive symptoms in widowed older adults was

associated with the lack of family support, especially after the loss of their spouses who are considered as intimate confidant.

Furthermore, Zhang and Li, 2011 explained that the death of a spouse results in significant loss. This loss is not only limited emotional support, but also a loss to material support and financial support, and opportunity for pleasurable activities. Therefore, widowed older adults are at risk for negative consequences such as altered mood, loneliness, feelings of unworthiness and hopelessness, and loss of meaning in life. The support received from friends could not compensate for the loss of a spouse among older adults, however friendship network has a significant impact on the symptoms of depression. Zhang and Li (2011) found that the married older adults (N=1428) with a better perception of stronger friend support had lower levels of depressive symptom than a widowed older adults who were receiving the same level of support from their friends.

Motivational factor. Social support can also act as a motivation for older adults and promote their participation in a physical activity. Damush, Perkins, Mikesky, Roberts, and O'Dea (2005) found that social support was one of the main reason that motivated 181 (N=191) older women with knee osteoarthritis to join the exercise program. Among them, married older women or those who had partner were more motivated than unmarried older women. Similarly, Wilcox, Bopp, Oberrecht, Kammermann, and McElmurray (2003) reported that 25% of participants (N=63) chose social support as a motivator for a physical activity. Therefore, participation in physical activity may be significantly increased when an older adult receives encouragement from family or friends, and has a partner with whom to exercise.

Social influence. Ikeda and Kawachi (2010) explained that the social influence is merely an influence on behaviors of an individual by the member of their social networks. Social networks through social influence can promote healthy behaviors such as participation in physical activity by enhancing one's self-efficacy, and maintaining adherence.

Physical activity. Huang et al. (2003) reported that a physical activity plays a pivotal role in promoting quality of life among older adults. They pointed out that the decline in muscle strength and balance as a result of aging can be improved by participating in exercise regularly. Resnick and Junlaapeya (2004) found that majority of older adults are physically inactive and do not exercise regularly as almost 95% of older adults (N=312) living in continuing care retirement community were not involved in regular exercise. Consequently, physical activity can help in reducing risk for falls because physical inactivity is one of the intrinsic risk factors for falls. There has been a close association between the lack of physical activity and the occurrence of falls as Huang et al. (2003) found statistical significance between the falls and involvement in regular exercise.

There is a great need to encourage older adults to participate in physical activity due to its benefits to physical and psychosocial health. Means et al. (2003) conducted a study which showed the positive impact of an exercise program on older adults' mental and physical health. They found that there was a statistically significant relationship between the exercise program and mobility, and ability to perform ADLs. In addition, the study also showed that the exercise program was effective in reducing psychological problems such as depression and anxiety. The prevalence of depression among 66 older adults (N=143) with a history of falls was clinically reduced from 39.4% to 24.2 % as a result of exercise intervention. They also concluded that group exercise can provide social contact among the participants.

Similarly, McAuley, Jerome, Marquez, Elavsky, and Blissmer (2003) found that older adults who are physically active and participate in a group exercise program enjoy their social support. This perceived social support from other participants helps to promote exercise efficacy among older adults. Roper, Molnar, and Wrisberg (2003) found that their male participant who is a marathon runner started running at the age of 64. His decision to participate in marathons was hugely influenced by his wife and claims that she is a great source of support for him. He stated that having his wife helps him to adhere to his exercise regimen in addition to his general health lifestyle. The presence of spouse is especially influential on self-efficacy and the physical activity of male participants compared to female participants aged 50-75 years old (Ayotte, Margrett, & Patrick, 2013).

Social engagement. Social engagement is another pathway through which the impact of social networks on health can be explained. According to Ikeda and Kawachi (2010, p. 238), social engagement refers to “participation in social activities through one’s social relationship”. They mentioned that participation in social activities not just offers an identity to older adults, but also promotes well-being through a sense of belongingness. Rogerson and Emes (2008) stated that older adults with a thinning social network are at higher risk for isolation, loneliness, sadness, and depression. In their study, one of the participants (N=15) stated that-

“My husband I used to go out every Friday night to play cards with our friends. There were a bunch of us and we would take turns hosting the party. After my husband died, I went to some of the card games and it wasn’t the same. I was the odd person out and sometimes they couldn’t find a partner for me. I got to feeling like a fifth wheel and eventually I stopped going altogether. I miss those parties and sometimes feel lonely” (2014, p. 6).

The researchers mentioned that the death of a spouse can significantly affect one's social engagement.

Access to material resources. This is another pathway through which social network can affect well-being of older adults. Social networks can provide access to material resources such as transportation, access to health, and assistance with ADLs and IADLs. Furthermore, social networks can play a significant role in modification of a home to reduce risk for falls among older adults.

Transportation, and Assistance with ADLs and IADLs. According to Rogerson and Emes (2008), lack of access to transportation can lead to social isolation as a result of decreased participation in social activities. They noticed that most of their participants (N=15) had no driver's license and were using alternate forms of transportation. Most of them were seeking help from family members for rides. They presented an example of an older woman who never learned to drive and mostly relied on husband for transportation. After the death of her husband, she had limited access to transportation and started skipping social gatherings with friends. Therefore, the lack of transportation might increase older adult's vulnerability to depression due to the decline in the social contact and participation. Moremen (2008) found that participants' (N=26) family and friends were very involved in helping older adults with instrumental activities of daily living such as setting up medications, cooking meals, and shopping.

Access to healthcare. Older adults are more likely to visit doctors when they have accessible social networks. Moremen (2008) found one of the participants in the study would receive help from her son or daughter in accessing proper health care. The woman mentioned that they take her to the doctor when she is sick or not taking her medication appropriately.

In addition, he also mentioned that older adults are constantly receiving encouragement and advice from their friends, family, or neighbors on their diet and exercise.

Home modification. Kelsey et al. (2010) found that of 524 indoor falls among participants (N=765), 77% happen in their own home. The environmental hazards in the home can be a great threat and increase probability of falls among community-dwelling adults. Therefore, there is a great need to modify the home environment to reduce home hazards and to prevent falls, and promote independence among community-dwelling older adults. However, Northridge and Levick (2002) concluded that the maintenance of home is often a difficult task for older adults. In such situations, social networks can be a great source of assistance to older adults with home modification.

Gopaul and Connelly (2012) stated that one of their participant's (N=10) daughter was very involved in assisting with home modification by finding resources online and reading all information required for modifications. The most common modifications adopted by the participants were "increasing lighting, keeping phone within reach during the day and night, replacing/installing smoke detectors, not using a footstool, using a nightlight, removing scatter rugs, and keeping a clear pathway to the bathroom"(Gopaul & Connelly, 2012, p. 64). Consequently, family members can help in home modifications and build safer environments at home for older adults.

Research on the Relationship between Social Variables and falls

There is limited published research regarding the impact of social variables such as social integration, social support, and support system on falls. This literature review was able to identify the three studies that were designed to determine the relationship between social factors such as social integration, social support, and support system and the risk for falls among older

adults living in the community. The findings of these studies were mixed because the two studies found no statistically significant relationship while one study found a correlation between family networks and fall risk.

Huang and colleague (2003) conducted a cross-sectional non experimental research in Taipei, Taiwan. They recruited a sample from four different sheltered housing units with a total number of 103 older adults who were 65 years and older. The purpose of their study was to identify different risk factors for falls. They listed demographics, physical function, and cognitive ability as intrinsic risk factors for falls while extrinsic risk factors included environment, footwear, and social support. Their findings suggested that there was no statistically significant difference between the total score of social support among the fallers and non-fallers.

Similarly, Guzman et al. (2013) selected Filipino older adults (N=125) who was living in the community to test the model. The model showed the interaction of autonomy, support system, environment safety, and depression with the risk for falls among older adults living in a community. From the data analysis, both the autonomy and support system showed little to no statistically significant relationship with the risk for falls. As a result, these two factors were removed from the model.

In contrast, Faulkner and colleagues' (2003) prospective study of community-dwelling women enrolled in the Study of Osteoporotic Fractures (SOF) was able to show the link between social integration and risk for falls. They reported that there was a 13% decline in the risk for falls among older women (N= 6692) with family network, while there was a positive correlation between risk for falls and friendship networks. Therefore, they concluded that stronger family networks decrease the risk for falls while weaker friendship networks decrease the risk for falls.

Summary

Among community-dwelling older adults, falls are a public health issue. In the literature review, multiple risk factors for falls were identified. These risk factors tend to increase with age and the accumulation of multiple risk factors poses a greater threat for falls among community-dwelling older adults. Further, the consequences of falls are not only limited to injuries among older adults, but also lead to huge loss of independence, and increase disabilities and fear of falling. Subsequently, falls of loved ones can be a burden to family members who fulfill a role of caregiver. Most importantly, falls among older adults has a larger impact on healthcare cost and society as a whole.

In general, social networks have a positive impact on health outcomes and promote healthy behaviors among older adults. Although there is limited research conducted on the impact of social networks and the risk for falls, there was much research that showed social networks effectiveness in reducing some of the risk factors of falls. This research demonstrated the effectiveness of social networks through the mechanism of social support, social influence, social engagement, and access to material resources. These mechanisms were able to improve physical activity, assist older adults with ADLs and IADLs, reduce depression, help in home modification, and make healthcare accessible to older adults. Falls that are not a part of normal aging because some of risk factors for falls are modifiable and can be reduced and managed. The prevention of falls among community-dwelling older adults may promote successful and healthy aging by creating fall-free environments.

CHAPTER III

METHODOLOGY

The purpose of this study was to determine the relationship between social networks and the risk for falls among community-dwelling older adults. This chapter describes the study design, study participants, instrumentation and data collection method, and data analysis techniques which will be utilized by the study.

Study Design

This descriptive correlational study utilized a cross-sectional survey for data collection. The data were collected between May and June, 2015 from participants by using paper survey between May and June 2015. The dependent variable of this study was the risk for falls among community-dwelling older adults. The independent variables for this study were the strength of social networks and three different types of social networks.

Participants

The participants in the study were determined by using a convenience sample of older adults living in senior housings, assisted living facilities, retirement communities, and home who attended programs offered through senior centers located in the south-central Minnesota. Memory care units were excluded from recruitment to ensure that only those participants who are legally competent were included in the sample. The participants were recruited by contacting senior centers, senior housings, assisted living facilities, and retirement communities via

telephone and e-mail. The researcher sought permissions from the facility administrators to participate as the research sites and announced the study at the facility's regularly-held residents meetings. After receiving permission from the facilities, the researcher recruited participants who are the residents or attendees by presenting the study. The sample included a total of 184 community-dwelling men and women who are 65 years of age or older living in the community.

Instrumentation

In this study, the data were collected by using the printed survey, which has three different sections: 1) Demographic Tool, 2) Fall Risk Questionnaire, and 3) Lubben Social Network Scale. These tools were used to collect data on demographics, risk for falls, and social networks measure. The three sections of the survey are described below.

Demographic Tool

The demographic tool utilized in this study, which consisted of a 5-itemed tool with both multiple-choice and fill-in-the blank formatted questions (see Appendix A). These questions were designed to measure age, gender, marital status, living arrangement, and ethnicity. This study was not investigating the effect of age and gender on falls, because previous studies (Resnick & Junlapeeya, 2004; Shumway-Cook, et al., 2009) had identified these variables as the potential risk factors for falls. Therefore, the variables such as age, gender, and ethnicity were used to describe the characteristics of the sample. On the other hand, the data on marital status and living arrangement might have provided some intriguing information regarding participants' social networks, however these variables were held constant. This section was constructed by the researcher and was reviewed by the members of the thesis committee for face validity.

Fall Risk Questionnaire

This study used Fall Risk Questionnaire (FRQ) that was developed by Rubenstein, Vivrette, Harker, Stevens, and Kramer (2011) as a fall risk assessment tool to measure the risk for falls among community-dwelling older adults. Initially, the FRQ had 13 items which measure potential risk factors for falls among community-dwelling older adults. However, after revisions one item which measured visual acuity was excluded as there was no statistical significance (Rubenstein et al., 2011). As a result, the revised FRQ consists of 12 items which were designed to measure the history of fall, fear of falling, overall health, vision impairment, balance and gait problem, use of assistive device, incontinence, depression, use of medications, muscle weakness, and abnormal sensation (See Appendix B).

The FRQ is the fall risk self-assessment questionnaire with a binary response format (yes/no) for each item. The total score on the FRQ is 14 which was obtained by summing the total number of points for all “yes” responses. Each “yes” response was assigned with 1 point, except for questions 1 and 5. Both questions 1 and 5 were assigned with 2 points which measured previous falls and use of assistive devices respectively. Rubenstein and associates (2011) compared the scores on the FRQ and clinical examinations by using Pearson correlation coefficient, linear regression, and a scatter plot. After these analyses, the fall risk cut-off point of a score 3 or greater was determined for the original tool with 13 items. The fall risk cut-off was also based on the prior experience and clinical judgment of the researcher (Rubenstein et al., 2011). However, the fall risk cut-off point for revised tool with 12 item was changed to a score of 4 or greater. Therefore, a score of 4 or greater in the FRQ indicates that an individual is at higher risk for falls. The FRQ has a reliability coefficient alpha of 0.746 (Rubenstein et al., 2011). Similarly, it had demonstrated excellent sensitivity and specificity in community-dwelling

older adults. The sensitivity and specificity for the FRQ were 100% and 83.3 % respectively. See Appendix C for the permission received from Dr. Laurence Rubenstein for using the FRQ.

Lubben Social Network Scale

This study utilized the Lubben Social Network Scale (LSNS) to measure the strength of social networks, which determines the size and quality of the social network. The LSNS was developed by Dr. James Lubben in 1988 which was later revised in 2002; LSNS-R. In the same year, an abbreviated version (LSNS-6) and expanded version (LSNS-18) were also developed. This study used the LSNS-18 (see Appendix D); an English version which was designed to measure social isolation among older adults by measuring the size of social networks, and the closeness and frequency of contacts with individuals' social networks such as family members, friends, and neighbors. Lubben and Gironda (2003) realized the need to create the LSNS-18 because family members, friends, and neighbors could be important sources of social support and may also have different functions during late adulthood. The LSNS-18 consists of 18 items, which measures the size, closeness, and frequency of social networks using three different Likert scale, 1) 0= never, 1= seldom, 2= sometimes, 3= often, 4= very often, and 5= always, 2) 0= less than monthly, 1= monthly, 2= few times in a month, 3= weekly, 4= four times a week, 5 (daily), and 3) 0= none, 1= one , 2= two, 3= three to four, 4= five through eight, and 5= nine or more.

Each item in the LSNS-18 has a score that ranges from 0 to 5 with a total score of 90. According to Emlet (2006), the LSNS-18 does not have any clinical cutoff for social isolation; however, the original LSNS had a score less than 20 as a cutoff for social isolation. Emlet (2006) mentioned that the same percentile ranking can be used for the LSNS-18 and score below 36 was considered as the higher risk for social isolation. This study also used a score less than 36 as a cutoff for social isolation. Therefore, high score in the LSNS-18 indicates that an individual has

greater social network and is at lower risk for social isolation (Lubben, Gironde, & Lee, 2002). The LSNS-18 reliability Cronbach alpha is 0.82 for an internal consistency while the correlation coefficient was 0.67 to 0.78 for family member subscale, 0.74 to 0.84 for friend subscale, and 0.65 to 0.78 for neighbors (Lubben & Gironde, 2003). On the other hand, the internal validity for the LSNS-18 has not been reported for the English version. The permission to use the LSNS-18 was obtained by contacting Jooyoung Kong via e-mail (see Appendix E) and "Requestor Information" was provided.

Procedure

After receiving permission from the Minnesota State University, Mankato's Institutional Review Board (see Appendix F) the survey was administered in groups in selected senior centers, retirement communities, and assisted living facilities located in the south-central Minnesota. The potential participants were informed about the purpose, procedure, risks, and benefits through a verbal explanation and a written consent form. In addition, the consent form explained that the participants should be 65 years or older to complete the survey, participation is strictly voluntary, and information collected through that the survey will remain anonymous and confidential. The researcher did not collect any data about participant's personal identity such as name, phone number, or address. They were also informed that they will be asked to provide information about their health, falls, and social history. The survey was administered by the researcher in May and June of 2015. The informed consent (see Appendix G) was obtained from each voluntary participant prior to the distribution of the survey.

Data Analysis

The data collected in the study was analyzed by using SPSS, version 22 for Windows. The demographics about the participants was analyzed by using descriptive statistics. The relationship between two variables that is social networks (score on the LSNS) and the risk for falls (score on the FRQ) was analyzed by using Pearson's correlation coefficient (r). Further, the score on the Lubben Social Network Scale was analyzed by using independent t-test at a value of $p < 0.05$ as statistically significant. The two groups that were used to compare the strength of social networks are the older adults who are at risk for falls and not at risk for falls.

Summary

The purpose of the study was to find the relationship between social networks and the risk for falls among community-dwelling older adults by using a cross-sectional survey design. The survey tool was designed to measure different variables such as demographic, risk for fall, and social networks. The data were collected from older adults who were 65 years or older. The data collected from the participants provided information on their risk for falls and social networks, which helped in explaining the relationship between them. Therefore, the determination of the relationship between social networks and the risk for falls might have been helpful in developing fall-prevention programs, which may be able to reduce, prevent, and manage falls among community-dwelling older adults.

CHAPTER IV

STUDY FINDINGS

The purpose of this study was to determine the relationship between social networks and the risk for falls among community-dwelling older adults. In addition, findings might have identified potential fall prevention strategies that could be implemented to reduce falls among community-dwelling older adults to promote safe, independent, healthy, and “fall-free” aging. This chapter will present the results of the current study.

Analysis of Data

Over a period of three weeks, a total of 218 surveys were distributed in May and June of 2015 among potential participants residing in the south central Minnesota. In the mid-week of June, a total of 184 surveys was collected with a completion rate of 88.40%. The surveys were distributed and collected at senior centers, assisted living facilities, senior housings, and retirement communities. The majority of the participants completed surveys at the facilities while few participants took surveys home, and returned to the facilities. Among 184 completed surveys, there were three surveys that had missing data in the Demographic section of the survey. However, the surveys with the missing data were included because the data from the demographics were only used to describe the characteristics of the sample and were not used for any important analysis.

The demographic data of the participants are presented in table 4.1. The total number of participants in the study was 184 community-dwelling older adults between the ages of 65 and 97 ($M = 77.54$, $SD = 7.90$). There were 142 females (77.60 %) and 41 males (22.40 %), which was

different than the total population of the south-central Minnesota. According to the United States Census Bureau (2015), the female population represents almost 51% of the total population of the south central Minnesota aged 65 year and above. The majority of the participants identified themselves as married (46.40 %) followed by widowed (39.30 %), divorced (6.60 %), single (5.50 %), separated (1.6 %), and partnered (0.50%). Most of the participants were living with a spouse in the community (44.80 %). The sample was mostly composed of White/Caucasian (99.50 %) older adults, which is similar to the population of the south-central Minnesota. There are almost 95% of White/Caucasian older adults who are 65 year and older in the south-central Minnesota (United States Census Bureau, 2015).

Table 4.1: Demographic data for the sample

<i>Variable</i>	<i>n</i>	<i>%</i>	<i>Missing</i>
Age			3
65-69	32	17.70	
70-74	41	22.60	
75-79	34	18.80	
80-84	37	20.50	
85-89	24	13.20	
90-94	9	5.00	
95-99	4	2.20	
Gender			1
Male	41	22.40	
Female	142	77.60	
Marital Status			1
Single	10	5.50	
Married	85	46.50	
Divorced	12	6.60	
Widowed	3	1.60	
Partnered	72	39.30	
Other	1	0.50	
Living Arrangement			1
Living alone	80	43.70	
Living with spouse	82	44.80	
Living with children	3	1.60	
Living with domestic partner	3	1.60	
Living with roommate or friend	3	1.60	
Living with other family member	3	1.60	
Other	9	4.90	
Race			1
White/Caucasian	182	99.50	
Hispanic	0	0.00	
African American	0	0.00	
Asian/Pacific Islander	0	0.00	
Native American	0	0.00	
Other	1	0.50	
Total (N)= 184			

Research question 1: For community-dwelling older adults, what is the relationship between the risk for falls and strength of their social networks? This question was addressed by using the total score on the Fall Risk Questionnaires (FRQ) and the Lubben Social Network Scale (LSNS). The total score on the FRQ is 14 with a fall risk cut-off point of a score of 4 or greater (Rubenstein et al., 2011). The score of 4 or higher represents that an individual is at higher for risk for falls. The participants' scores ranged from 0 to 14, with a mean of 4.16 (SD= 3.17) on the FRQ (See Table 4.2).

Table 4.2: Score on the Fall Risk Questionnaires (FRQ)

<i>Variable</i>	<i>Mean Score</i>	<i>Standard Deviation</i>	<i>Maximum</i>	<i>Minimum</i>
Risk for falls	4.16	3.17	14.00	0.00
Total (N)= 184				

Among 184 older adults, on the FRQ 40 of them reported a fall within the last six months and 89 responded that they are worried about falling (see Table 4.3). A descriptive statistics were conducted to determine about the characteristics of the fallers. The result depicted that the participants who had fallen in the last six months included 11 males and 29 females. Almost 50% of the fallers were widowed older adults living alone in the community. The responses of the participants on the FRQ and characteristics of fallers are presented in table 4.3.

Table 4.3: Participants' responses on the Fall Risk Questionnaires (FRQ)

<i>Item</i>	<i>Yes n (%)</i>	<i>No n (%)</i>
1. I have fallen in the last 6 months.	40 (21.70)	144 (78.30)
2. I am worried about falling.	89 (48.40)	95 (51.60)
3. Sometimes, I feel unsteady when I am walking.	100 (54.30)	84 (45.70)
4. I steady myself by holding onto furniture when walking at home.	58 (31.50)	126 (68.50)
5. I use or have been advised to use a cane or walker to get around safely.	53 (28.80)	131 (71.20)
6. I need to push with hands to stand up from a chair.	82 (44.60)	102 (55.40)
7. I have some trouble stepping up onto a curb.	59 (32.10)	125 (67.90)
8. I often have to rush to the toilet.	67 (36.40)	117 (63.60)
9. I have lost feeling in my feet.	23 (12.50)	161 (87.50)
10. I take medicine that sometime makes me feel light-headed or more tired than normal.	38 (20.70)	146 (79.30)
11. I take medicine to help me sleep or improve my mood.	49 (26.60)	135 (73.40)
12. I often feel sad or depressed.	15 (8.20)	169 (91.80)
Total (N)=184		

On the other hand, the total score on the LSNS is 90. The score below 36 on the LSNS was considered as the higher risk for social isolation (Emlet. 2006). A high score on the LSNS indicates that an individual has a greater social network and is at lower risk for social isolation (Lubben, Gironde, & Lee, 2002). The participants' scores ranged from 9 to 75, with a mean of 42.78 (SD= 12.65) on the LSNS (See Table 4.4). In addition, the responses of the participants on the LSNS are presented in table 4.5.

Table 4.4: Score on the Lubben Social Network Scale (LSNS)

<i>Variable</i>	<i>Mean Score</i>	<i>Standard Deviation</i>	<i>Maximum</i>	<i>Minimum</i>
Social Networks	42.78	12.65	75.00	9.00
Total (N)= 184				

The relationship between the strength of social networks and the risk for falls was determined by conducting a correlation analysis of the total scores on the LSNS and the FRQ. The findings showed that there is a weak negative relationship ($r = -0.116$, $p = 0.058 > 0.05$) between the risk for falls and social networks (See Table 4. 6). It was hypothesized that there will be a negative relationship between the risk for falls and strength of social networks among community-dwelling older adults (Hypothesis 1) and was not supported by the findings. Even though, the findings showed that a weak negative relationship between the strength of social networks and the risk for falls, it was not statistically significant.

Table 4.6: Relationship between social networks and the risk for falls

<i>Variable</i>	<i>Risk for falls</i>	
	<i>Pearson correlation coefficient</i>	<i>p-value (1-tailed)</i>
Social Networks	-0.116	0.058

Total (N) = 184

Research question 2: For community-dwelling older adults, is the relationship different between the risk for falls and social networks of family, neighbor, and friendship? This question was addressed through the evaluation of the total score on the Fall Risk Questionnaires (FRQ) and the score of the three different social networks sub-scale on the Lubben Social Network Scale (LSNS) i.e. family network score, neighborhood network score, and friendship network score. The total score on the three different social networks is 30. The scores on the different social networks among the participants in this study are presented in Table 4.7. The participants' score ranged from 0 to 30 for family network score ($M = 17.30$, $SD = 5.39$), 0 to 25 ($M = 11.53$, $SD = 5.44$) for neighbor network score, and 0 to 25 ($M = 13.94$, $SD = 5.60$) for friendship network score.

Table 4.7: Score on the three different type of social networks measured by the LSNS: Family Network, Neighbor Network, and Friendship Network

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Minimum</i>	<i>Maximum</i>
Family Network	17.30	5.39	0.00	30.00
Neighbors Network	11.53	5.44	0.00	25.00
Friendship Network	13.94	5.60	0.00	25.00
Total (N) = 184				

The relationship between three different types of social networks and the risk for falls was determined by conducting a correlation analysis of the total scores on the FRQ and the scores on family, neighbor, and friendship networks sub-scale (See Table 4. 8). The findings showed that there is a weak negative correlation between the risk for falls and family networks ($r = -0.11$, $p = 0.137 > 0.05$), neighbor networks ($r = -0.053$, $p = 0.474 > 0.05$), and friendship networks ($r = -0.105$, $p = 0.157 > 0.05$). The result revealed that the relationship of family and friendship network with the risk for falls has minimal or no marginal difference. It was hypothesized that the relationship between the risk for falls and social networks of family, neighbor, and friendship among community-dwelling older adults will be different (Hypothesis 2) and was not supported by the findings. In spite of the fact that the findings revealed there is a weak negative relationship between the three different types of social networks and the risk for falls, they were not statistically significant.

Table 4.8: Relationship between the three different types of social networks measured by the LSNS: Family Network, Neighbors Network, and Friendship Network and the risk for falls

<i>Variable</i>	<i>Risk for falls</i>	
	<i>Pearson correlation coefficient</i>	<i>p-value (2-tailed)</i>
Family Network	-0.11	0.137
Neighbors Network	-0.053	0.474
Friendship Network	-0.10	0.157
Total (N) = 184		

Hypothesis 3: There will be a difference between community-dwelling older adults who are at risk for falls and not at risk for falls based on the strength of their social networks. This hypothesis was tested by conducting an independent sample t-test analysis of the participants' total score on the LSNS. The participants were divided into two groups based on their score on the FRQ to compare the difference on the total score of the LSNS. The first group included the participants who were not at risk for falls with the score ranged from 0-3 on the FRQ. On the other hand, the second group had the participants who were at risk for falls with the score ranged from 4-14 on the FRQ.

The findings on the differences between these two groups are presented in Table 4.9. There were 99 (53.80 %) and 85 (46.20 %) participants in the current study who were at risk for falls and not at risk for falls respectively. The result showed that there is a difference between the strength of social networks among two groups. The mean score of the first group on the Lubben Social Network Scale was 40.76 (SD=13.11), which is lower than that of the second group (M=45.12, SD=11.73). In addition, the difference between the two groups was statistically significant, $t(182) = 2.36$, $p = 0.019 < 0.05$ (See table 4.10) with a small effect size ($r=0.17$). Therefore, a small effect of 0.17 accounts for only 1% of the total variance of the score on the LSNS among two groups.

Table 4.9: Score on the LSNS between two groups

<i>Variable</i>	<i>Score range</i>	<i>Group</i>	<i>Mean</i>	<i>Standard Deviation</i>	<i>Standard Error Mean</i>
Social Networks	0-3	Not at risk for falls.	45.12	11.73	1.27
	4-12	At risk for falls.	40.76	13.11	1.31
Total (N)		184			

Table 4.10: Independent sample t-test of equal variances assumed

<i>Variable</i>	<i>t</i>	<i>df</i>	<i>Significance (p-value, 2 tailed)</i>
Social Networks	2.36	182	0.019
Total (N) = 184			

CHAPTER V

DISCUSSION, LIMITATIONS, RECOMMENDATIONS, AND SUMMARY

The purpose of the study of community-dwelling older adults living in the south-central Minnesota was to determine the relationship between social networks and the risk for falls. This study had not only explored the absence or presence of different types of social networks, but also assessed the impact of the size of social networks, frequency of contact, and closeness with social networks on the risk for falls among community-dwelling older adults. The aim of this chapter is to provide a summary and conclusion, and offer recommendations based on the findings of the present study for the future researcher.

Discussion

Falls among community-dwelling older adults is a major public health issue. The incidence of falls is higher among older adults and various risk factors for falls, such as age, gender, medication, balance problem, vision impairment, environmental hazards, and so forth have been identified (Rekeneire et al., 2003; Jung, Shin, Chung, & Lee, 2007; Kelsey et al., 2010). Additionally, the consequences of falls may lead to injuries, huge loss of independence, institutionalization, and even death among older adults (CDC, 2014). The increasing proportion of older adults' population demands for the effective fall prevention strategies to manage, reduce, and prevent falls. An effective fall prevention strategy is required to minimize the consequences of falls and the healthcare costs related to fall-related injuries.

In general, social networks have a positive impact on health outcomes and promote healthy behaviors among older adults (Thanakwang & Soonthornthada, 2011). Although there is limited research conducted on the impact of social networks and the risk for falls, there was much research that showed social networks effectiveness in reducing some of the risk factors of falls. The functional and structural dimension of social networks were able to improve physical activity, assist older adults with ADLs and IADLs, reduce depression, help in home modification, and make healthcare accessible to older adults. There is limited research on the impact of social networks on the risk for falls among community-dwelling older adults.

The present study determined the relationship between social networks and the risk for falls among community-dwelling older adults, who were 65 years or older and residing in the south-central Minnesota. Firstly, the results of this study showed that there is a weak negative relationship between the strength of social networks and the risk for falls, but not statistically significant. The hypothesis that there would be a negative relationship between the strength of social networks and risk for falls was not supported by the findings. Therefore, there is no significant correlation relationship between social networks and the risk for falls among community-dwelling Caucasian older adults. In order to ensure the sampling bias, a statistical significance test was conducted among fallers and non-fallers. The results revealed that there is no significant difference in the strength of social networks among fallers and non-fallers. There was no statistically significant difference on the total score on the LSNS among fallers and non-fallers.

The lack of evidence for the relationship between social networks and the risk for falls is very similar to a previous study, which did not show a significant relationship between the support system and risk for falls (Guzman et al., 2013). Guzman and colleagues (2013)

mentioned that the lack of relationship between social networks and the risk for falls prevails because the interaction between these two variables is as an outcome of multiple factors. For instance, an older adult may have a strong social network; however the level of assistance and constancy of help received from the member of social networks, and the dedication of the member of social networks may impact the relationship between social network and the risk for falls. In contrast, the social network may offer psychosocial mechanisms which may have potential to protect health, but may not be influential in protecting against the risk for falls (Faulkner et. al., 2001).

Secondly, the three different types of social networks that is family network, neighbor network, and friendship network also depicted a weak negative relationship with the risk for falls, which were not statistically significant. The hypothesis that the relationship between the risk for falls among community-dwelling older adults and social networks of family, friendship, and neighborhood would be different was also not supported. The results in the current study were different than a previous study (Faulkner et al., 2003) in which family network was negatively correlated with the risk for falls while friendship network was positively correlated with the risk for falls. The variation in the present study findings might be a result of the small sample size, and time limitation.

Among the three different types of social network, participants' mean score was higher on the family network than neighbor and friendship network. This was evident with the responses of the participants on the LSNS for neighbor and friendship network sub-scale. According to the participants' responses on the LSNS, they had a medium sized family, neighbor, and friendship network with frequent contacts. However, most of them did not prefer to talk to friends and neighbors about private matters, and important decision or ask for help. The

scores of the items about decision making and help for neighbors and friendship network on the LSNS (9, 10, 11, 12, 15, 16, 17, and 18) were lower compared to the family network.

Further, few surveys were returned with qualitative feedbacks in which the participants mentioned that they seek help, and talk about important and private matters with their immediate family such as their children, and siblings. According to Faulkner et al. (2003), this finding in line with the theories that the family network might offer opportunity for assistance, help, and access to resources. On the other hand, friendship and neighbor networks might keep one socially active, but may not provide the same benefits. The family network may be the most important network, which is capable of offering the different outcome of social networks such as social support, social engagement, social influence, and access to material resources as explained by Berkman's theoretical model of the impact of social networks on health of older adults (Berkman et al., 2000).

Finally, there was a statistically significant difference in the strength of social networks between community-dwelling Caucasian older adults who were at the risk for falls and not at the risk for falls. This finding was different than the previous similar studies (Huang et al., 2003), which found no statistical significance on the total score of social support among fallers and non-fallers. Therefore, it can be concluded that the differences in the total score on the LSNS do exist between the participants who were at risk for falls and not at risk for falls. The Caucasian older adults who are at risk for falls scored less on the LSNS than the older adults who are not at risk for falls.

Limitations

There were several limitations of the study. Firstly, the use of convenience sampling methods might have increased the probability of obtaining a biased sample because there might be a possibility of overrepresentation of high functioning older adults living in the community. Secondly, the use of paper survey to collect data might have limited the validity of responses from participants because of the language comprehension and interpretation differences. Thirdly, the length of the paper survey with thirty five questions posed as the limitation of the study. There were some participants who thought that the survey was long and requested to complete at their home rather than at the facilities. The length of the survey might have impacted the completion rate and participation of the community-dwelling older adults.

Another limitation is that the study assumed that there was similarity between the men and women participants' responses. However, the preliminary gender analysis conducted to compare the total score in the LSNS between men and women showed that there is a difference in the strength of social networks among men and women participants. Lastly, the data collected from the participants relied on the participants' ability to recall past experiences, which might raise certain questions regarding the validity of the data.

Recommendations

Falls that are not a part of normal aging, but the result of interaction between multiple risk factors are preventable. The various risk factors for falls are modifiable and can be reduced and managed. The family networks seemed to be a preferable network among the participants as the mean score on the family network sub-scale is comparatively higher than on the neighbor and friendship network sub-scale. The participants were also more comfortable in sharing private matters, asking for help, and involving family in decision making. However, the relationship

between family network and the risk for falls was not statistically significant. Thus, the family network may not protect against falls among Caucasian community-dwelling older adults.

However, the participants' responses on the LSNS and qualitative feedbacks on the survey suggest that there may be a strong relationship with the family and it is an important source of social support. It triggers a recommendation for aging services provider such as case workers, or nurses who are looking for alternative living arrangement for older adults should have a list of facilities that are closer to their family members. In this way, older adults may continue to receive social support even after moving out of their home.

On the other hand, older adults who live alone in the community should be encouraged to participate in activities offered through community senior centers because with age there is a higher risk of social isolation (Renfro & Fehrer, 2011). According to Renfro and Fehrer (2011), the thinning of the social networks size due to the loss of spouse, employment, and independence of driving is very likely during older adulthood. They also stated that these situations may lead to physical inactivity, cognitive decline, and increased the risk for falls. Older adults living alone in the community who have a weak family networks can build a strong friendship support network in the community through active participation in programs offered by senior centers.

The programs can offer an opportunity for an individual to develop valuable and long-term friendship (Rogerson & Ames, 2014). The current research study has also shown that the friendship is as strong as family networks for Caucasian older adults as the participants are more likely to share and discuss private matters and ask for help from friends than the neighbors. The future research should also be directed more toward the impact of family and friendship networks on the risk for falls as older adults are more likely to have close and meaningful relationship with family and friends.

The current study provided some evidence that there is a weak negative relationship between social networks and the risk for falls, which was not statistically significant. The sample represented a group of a homogenous population of Caucasian community-dwelling older adults and the findings cannot be generalized to the population as a whole. In future research, it is suggested to recruit the diverse and large sample to determine the impact of ethnic groups on the relationship between social networks and the risk falls among community-dwelling older adults. This will help to generalize the findings among the target population.

Consequently, the current study used the demographic information to describe the sample. The information on age, gender, marital status, living arrangement, and race were held constant because these socioeconomic factors has been identified as risk for falls in various previous studies. Therefore, this study did not focus on the impact of these socioeconomic factors on the relationship of social networks and the risk for falls. However, a quick gender analysis was conducted and the results showed that there is statistically significant difference in the strength of social network among Caucasian men and women. The total score on the LSNS for men was significantly lower than the women participants. Hence, it is suggested to include the gender as an independent variable in the future studies.

The study revealed that there is statistically significant difference in the strength of social networks among the older adults who are at risk for falls and not at risk falls. The older adults who are at risk for falls scored lower on the LSNS. However, the practical significance was very small, thus the differences in the score between two groups is not only the result of the risk for falls, but there is a possible effect of other confounding factors such as level of assistance, medical, and physical factors (Faulkner et al., 2003). Likewise, Huang and colleagues (2003) found a low level of activities and a decline in functional activities was higher among

participants who were faller. In future studies, it is suggested to explore both the direct relationship of the social network with the risk for falls and an indirect relationship between them through the impact on individual risk factors such as vision impairment, depression, number and type of medications, assistance with activities of daily living and instrumental activities of daily living, history of physical activity, and history of falls. Therefore, the analytic tool such as path analysis can be used to understand the main and indirect relationships of the social network with the risk for falls rather than a simple bivariate correlation analysis.

Finally, the LSNS tool used to determine the strength of social networks in the current study measures the social contact and social isolation by inquiring about the size, closeness, and frequency of social contact; the amount of help received, involvement in private matters and decision making of family, neighbors, and friends. The impact of functional dimensions of social network such as social support, emotional support, assistance, and access to material resources such as healthcare and transportation is unclear. Therefore, it is recommended to use a tool that is not only effective in measuring the structural dimension i.e. the size, frequency, and closeness, but also measure the quality and functional dimensions of social networks. This will help to understand the impact of social networks on the various identified risk factors for falls in the future research.

Summary

The purpose of this study was to determine the relationship between social networks and the risk for falls among community-dwelling older adults residing in the south-central Minnesota. The analysis that was conducted in this study determined the correlation between social networks and the risk for falls, correlation between different type of social networks and the risk for falls, and the difference in the total score of LSNS between older adults who are at

risk for falls and not at risk for falls. The dependent variable of this study was the risk for falls among community-dwelling older adults. The independent variables for this study were the size and the quality of different type of social networks.

This study utilized a paper survey, which included three different sections: 1) Demographics Tool, 2) Fall Risk Questionnaire (FRQ), and 3) Lubben Social Network Scale (LSNS). These tools were used to collect data on demographics, risk for falls, and social networks measure. The demographic tool was used to describe the characteristics of the participants. The data from the demographics was not used for any statistical analysis to measure the relationship between the variables. The FRQ tool helped to measure the dependent variable of the study; the risk for falls among community-dwelling older adults. Lastly, the LSNS tool was used to measure the independent variable of the study; social networks.

In this study, there was no statistically significant relationship between social networks and risk for falls. Similarly, the relationship between different type of social networks and the risk for falls were not different from each other and had no statistical significance. In contrast, there was statistically significant difference on the strength of social networks between the community-dwelling older adults who were at risk for falls and not at risk for falls. The mean score of the older adults who were at risk were lower than the older adults who were not at risk for falls. This result was different than previous two studies, which found no statistically significant relationship between the risk for falls and the total score on the social support (Guzman et al., 20013; Huang et al., 2003). Therefore, the results suggest that older white adults who are at risk for falls may be at higher risk for social isolation compared those who are not at risk for falls.

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APPENDIX A

Demographic

Direction: Please check the appropriate box or fill in the blank with your responses for the following questions.

1. What is your age in years?
2. What is your gender?
 - ☐ Male
 - ☐ Female
3. What is your marital status?
 - ☐ Single
 - ☐ Married
 - ☐ Divorced
 - ☐ Separated
 - ☐ Widowed
 - ☐ Partnered
 - ☐ Other
4. How would you describe your living arrangement?
 - ☐ Living alone
 - ☐ Living with spouse
 - ☐ Living with children
 - ☐ Living with domestic partner
 - ☐ Living with roommate or friend
 - ☐ Living with other family member
 - ☐ Other
5. How would you classify yourself?
 - ☐ White/Caucasian
 - ☐ Hispanic
 - ☐ African American
 - ☐ Asian/Pacific Islander
 - ☐ Native American
 - ☐ Other

APPENDIX B**Fall Risk Questionnaire**

Direction: Please check the appropriate box with your responses for the following questions.

1. I have fallen in the last 6 months.

☐ Yes

☐ No

2. I am worried about falling.

☐ Yes

☐ No

3. Sometimes, I feel unsteady when I am walking.

☐ Yes

☐ No

4. I steady myself by holding onto furniture when walking at home.

☐ Yes

☐ No

5. I use or have been advised to use a cane or walker to get around safely.

☐ Yes

☐ No

6. I need to push with hands to stand up from a chair.

☐ Yes

☐ No

7. I have some trouble stepping up onto a curb.

☐ Yes

☐ No

8. I often have to rush to the toilet.

☐ Yes

☐ No

9. I have lost feeling in my feet.

☐ Yes

☐ No

10. I take medicine that sometime makes me feel light-headed or more tired than usual.

☐ Yes

☐ No

11. I take medicine to help me sleep or improve my mood.

☐ Yes

☐ No

12. I often feel sad or depressed.

☐ Yes

☐ No

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Appendix C

Permission to use Fall Risk Questionnaire

Rubenstein, Laurence Z (HSC) <laurence-rubenstein@ouhsc.edu>

Tue 6/30/2015 9:22 AM

To: Sikhrakar, Smita;

Cc: Kramer, Josea (Josea.Kramer@va.gov);

You replied on 6/30/2015 11:44 PM.

Dear Smita,

Yes, you have our permission to use the FRQ as you requested.

Best wishes,

Laurence Z. Rubenstein, MD, MPH, FACP

Professor and Chairman, Donald W. Reynolds Department of Geriatric Medicine

The Donald W. Reynolds Chair in Geriatric Medicine

The University of Oklahoma, HSC

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Oklahoma City, Oklahoma 73117

405.271.8124 (Fax) 405.271.3887

laurence-rubenstein@ouhsc.edu

Sikhrakar, Smita

Mon 6/29/2015 1:15 PM

Sent Items

To: Rubenstein, Laurence Z (HSC) <laurence-rubenstein@ouhsc.edu>;

Dear Dr. Rubenstein,

My name is Smita Sikhrakar, a graduate student at Minnesota State University, Mankato. I contacted you earlier to seek permission to use the FRQ and you granted me the permission. However, today at my thesis defense I was suggested to seek permission from you to use the copy of the FRQ in my thesis publication, presentation, and future publications (if I submit it for publication). I have attached the copy of the FRQ in the presentation and Appendix of my thesis work. Please let me know if it is not an issue to put the copy. I know that you were interested in my findings and I am willing to share with you once I make changes and implement the suggestions of my thesis committee member.

It would be really grateful if you could grant me a permission to put the copy of the FRQ in the thesis publication, presentation, and future publication. Looking forward to hear back from you.

Sincerely,

Smita Sikhrakar

Rubenstein, Laurence Z (HSC) <laurence-rubenstein@ouhsc.edu>

Thu 2/19/2015 4:58 PM

To: Sikhrakar, Smita;

Cc: Josea Kramer Ph. D <Josea.Kramer@va.gov>;

Dear Smita,

On behalf of my coauthors, you have our permission to use the FRQ. We will be most interested to hear about your findings--please keep us in the loop. Don't hesitate to ask if you have questions.

Best,

Laurence Rubenstein

Sikhrakar, Smita

Thu 2/19/2015 11:27 AM

To: laurence-rubenstein@ouhsc.edu;

Dear Dr. Rubenstein,

My name is Smita Sikhrakar, a graduate student at Minnesota State University, Mankato. I am enrolled in Masters of Aging program and currently working on my research proposal for my graduate program. The title of my thesis is "Falls among community dwelling older adults: Determining the relationship between social networks and the risks for falls". I have been researching for standard tools for some time now and among those the fall risk tools that fits best with my research and also help me identify risk factors among my sample of the study is "Fall Risk Questionnaire (FRQ)". I am intending to use FRQ to determine risk factors among the older adults dwelling in the community. I will be using FRQ as a part of a survey for my study in which the older adults who are 65 years or older will take a survey.

It would be really grateful if you could grant me a permission to use FRQ. Looking forward to hear back from you.

Sincerely,

Smita Sikhrakar

Appendix D**Lubben Social Network Scale**

Direction: Please choose the appropriate box for the following questions.

FAMILY: Considering the people to whom you are related by birth, marriage, adoption, etc...

1. How many relatives do you see or hear from at least once a month?

☐ 0= none
☐ 1= one
☐ 2= two
☐ 3= three or four
☐ 4= five thru eight
☐ 5= nine or more

2. How often do you see or hear from relative with whom you have the most contact?

☐ 0= less than monthly
☐ 1= monthly
☐ 2= few times a month
☐ 3= weekly
☐ 4= four times a week
☐ 5= daily

3. How many relatives do you feel at ease with that you can talk about private matters?

☐ 0= none
☐ 1= one
☐ 2= two
☐ 3= three or four
☐ 4= five thru eight
☐ 5= nine or more

4. How many relatives do you feel close to such that you could call on them for help?

☐ 0= none
☐ 1= one
☐ 2= two
☐ 3= three or four
☐ 4= five thru eight
☐ 5= nine or more

5. When one of your relatives has an important decision to make, how often do they talk to you about it?

- ☐ 0= never
- ☐ 1= seldom
- ☐ 2= sometimes
- ☐ 3= often
- ☐ 4= very often
- ☐ 5= always

6. How often is one of your relatives available for you to talk when you have an important decision to make?

- ☐ 0= never
- ☐ 1= seldom
- ☐ 2= sometimes
- ☐ 3= often
- ☐ 4= very often
- ☐ 5= always

NEIGHBORS: Considering those people who live in your neighborhood...

7. How many of your neighbors do you see or hear from at least once a month?

- ☐ 0= none
- ☐ 1= one
- ☐ 2= two
- ☐ 3= three or four
- ☐ 4= five thru eight
- ☐ 5= nine or more

8. How often do you see or hear from the neighbor with whom you have the most contact?

- ☐ 0= less than monthly
- ☐ 1= monthly
- ☐ 2= few times a month
- ☐ 3= weekly
- ☐ 4= four times a week
- ☐ 5= daily

9. How many neighbors do you feel at ease with that you can talk about private matters?

- ☐ 0= none
- ☐ 1= one
- ☐ 2= two
- ☐ 3= three or four
- ☐ 4= five thru eight
- ☐ 5= nine or more

10. How many neighbors do you feel close to such that you could call on them for help?

- ☐ 0= none
- ☐ 1= one
- ☐ 2= two
- ☐ 3= three or four
- ☐ 4= five thru eight
- ☐ 5= nine or more

11. When one of your neighbors has an important decision to make, how often do they talk to you about it?

- ☐ 0= never
- ☐ 1= seldom
- ☐ 2= sometimes
- ☐ 3= often
- ☐ 4= very often
- ☐ 5= always

12. How often is one of your neighbors available for you to talk when you have an important decision to make?

- ☐ 0= never
- ☐ 1= seldom
- ☐ 2= sometimes
- ☐ 3= often
- ☐ 4= very often
- ☐ 5= always

FRIENDSHIP: Considering your friends who do not live in your neighborhood...

13. How many of your friends do you see or hear from at least once a month?

- ☐ 0= none
- ☐ 1= one
- ☐ 2= two
- ☐ 3= three or four
- ☐ 4= five thru eight
- ☐ 5= nine or more

14. How often do you see or hear from the friend with whom you have the most contact at least once a month?

- ☐ 0= less than monthly
- ☐ 1= monthly
- ☐ 2= few times a month
- ☐ 3= weekly
- ☐ 4= four times a week
- ☐ 5= daily

15. How many friends do you feel at ease with that you can talk about private matters?

- ☐ 0= none
- ☐ 1= one
- ☐ 2= two
- ☐ 3= three or four
- ☐ 4= five thru eight
- ☐ 5= nine or more

16. How many friends do you feel close to such that you could call on them for help?

- ☐ 0= none
- ☐ 1= one
- ☐ 2= two
- ☐ 3= three or four
- ☐ 4= five thru eight
- ☐ 5= nine or more

17. When one of your friends has an important decision to make, how often do they talk to you about it?

- ☐ 0= never
- ☐ 1= seldom
- ☐ 2= sometimes
- ☐ 3= often
- ☐ 4= very often
- ☐ 5= always

18. How often is one of your friends available for you to talk when you have an important decision to make?

- ☐ 0= never
- ☐ 1= seldom
- ☐ 2= sometimes
- ☐ 3= often
- ☐ 4= very often
- ☐ 5= always

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Appendix E

Permission to use Lubben Social Network Scale

Jooyoung Kong <kongje@bc.edu>

Mon 6/29/2015 3:19 PM

To: Sikhrakar, Smita;

You replied on 6/29/2015 3:23 PM.

Dear Smita Sikhrakar,

I am very sorry for the late reply. You are more than welcome to use the scale. It is not an issue at all to put the copy in your work.

Please let me know if you have any questions or concerns. Good luck with your studies!

Thanks.

Jooyoung

Sikhrakar, Smita

Mon 6/29/2015 1:19 PM

To: Jooyoung Kong <kongje@bc.edu>;

Dear Jooyoung,

My name is Smita Sikhrakar, a graduate student at Minnesota State University, Mankato. I contacted you earlier to seek permission to use the LSNS and you granted me the permission. However, today at my thesis defense I was suggested to seek permission from you to use the copy of the LSNS in my thesis publication, presentation, and future publications (if I submit it for publication). I have attached the copy of the FRQ in the presentation and Appendix of my thesis work. Please let me know if it is not an issue to put the copy.

It would be really grateful if you could grant me a permission to put the copy of the LSNS in the thesis publication, presentation, and future publication. Looking forward to hear back from you.

Sincerely,

Smita Sikhrakar

Jooyoung Kong <kongje@bc.edu>

Mon 10/27/2014 4:10 PM

To: Sikhrakar, Smita;

Dear Smita,

You can definitely use the scale! Sorry if you waited my response. Please let me know if you have other questions or concerns. Thanks!!

Jooyoung

From: "Sikhrakar, Smita" <smita.sikhrakar@mnsu.edu>
 Date: 10/27/2014 4:05 PM (GMT-05:00)
 To: jooyoung.kong@bc.edu
 Subject: Inquiry about LSNS

Dear Jooyoung,

I am inquiry about using the LSNS. I sent you my requestor information form week ago. I hope you received it otherwise I can resend it. I am not certain that if I could use the LSNS or not. I know website says we could use, however I am not sure if I need an electronic or written permission. Looking forward to hear back you.

Sincerely,

Smita Sikhrakar

Sikhrakar, Smita

Tue 10/21/2014 12:18 AM

Sent Items

To: Jooyoung Kong <kongje@bc.edu>;
 1 attachment

Requestor info for LSNS.docx13 KB

Dear Jooyoung,

My name is Smita Sikhrakar, a graduate student in Aging Studies Program at Minnesota State University, Mankato. Recently, I came across LSNS while reading an article for my literature review and upon more research I had an opportunity to learn more about the scale through Boston College website. Therefore, I am writing this email to grant me a permission to use LSNS for my study. I would be grateful if you would allow me to use this scale for my study which will help me collect data effectively. In addition, I believe that this tool will support one of my main construct of the study i.e. social network.

As per a request in the website I am attaching my requestor info in this e-mail which explains briefly about my thesis and my study of interest. Please let me know if you need any additional information from me. Looking forward to hear back from you.

Thank You!

Smita Sikhrakar

Appendix F

IRB Approval Letter



May 2, 2015

Dear Donald Ebel, Ph.D:

Re: IRB Proposal entitled "[743348-3] Falls among community-dwelling older adults: Determining the relationship between social networks and the risk for falls" Review Level: Level [I]

Your IRB Proposal has been approved as of May 2, 2015. On behalf of the Minnesota State University, Mankato IRB, we wish you success with your study. Remember that you must seek approval for any changes in your study, its design, funding source, consent process, or any part of the study that may affect participants in the study. Should any of the participants in your study suffer a research-related injury or other harmful outcome, you are required to report them to the Associate Vice-President of Research and Dean of Graduate Studies immediately.

When you complete your data collection or should you discontinue your study, you must submit a Closure request (see <http://grad.mnsu.edu/irb/continuation.html>). Please include your IRBNet ID number with any correspondence with the IRB.

The Principal Investigator (PI) is responsible for maintaining signed consent forms in a secure location at MSU for 3 years. If the PI leaves MSU before the end of the 3-year timeline, he/she is responsible for following "Consent Form Maintenance" procedures posted online (see <http://grad.mnsu.edu/irb/storingconsentforms.pdf>).

Sincerely,

A handwritten signature in cursive script, appearing to read "Mary Hadley".

Mary Hadley, Ph.D.
IRB Coordinator

A handwritten signature in cursive script, appearing to read "Julie A. Carlson".

Julie Carlson, Ed.D.
IRB Co-Chair

A handwritten signature in cursive script, appearing to read "Jeffrey Buchanan".

Jeffrey Buchanan, Ph.D.
IRB Co-Chair

Appendix G

CONSENT FORM

We invite you to participate in a research study involving a survey of social networks and falls. The purpose of this study is to find the relationship between social networks and risk for falls among community-dwelling older adults. If you agree to participate you will be asked questions about your social networks and health status. All of your responses will be kept confidential, and can be viewed only by authorized research staff members (*Smita Sikhrakar, and Donald Ebel*). The survey takes about 10 to 15 minutes to complete.

This research project is being directed by Dr. Donald Ebel. You can contact Dr. Ebel at 507-389-5188 or donald.ebel@mnsu.edu about any concerns you have about this project. You also may contact the Minnesota State University, Mankato Institutional Review Board Administrator, Dr. Barry Ries, at 389-2321 or barry.ries@mnsu.edu with any questions about research with human participants at Minnesota State University, Mankato.

To participate in the study, you must be 65 years or older. The participation in this project is voluntary and you have the right to stop at any time. Your decision whether to participate will not affect your relationship with Minnesota State University, Mankato, nor will a refusal to participate involve a penalty or loss of benefits. There are no direct benefits to you as a result of participation in this research.

None of your answers will be released and no names will be recorded. The risks of participating in this study are about the same as are encountered in daily life. Participating in this study will help the researchers better understand the relationship between social networks and risk for falls among community-dwelling older adults.

If you are at least 18 years old and agree to participate in this research, please sign below. Please keep the other copy for your records.

Your Signature _____ Date _____

MSU IRBNet ID# 743348

Date of MSU IRB approval: 05/02/2015

